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09/771,371	01/26/2001	Andrew V. Kadatch	3382-55827	6459

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EXAMINER	
JACKSON, JAKIEDA R	

ART UNIT	PAPER NUMBER
2655	

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/771,371	KADATCH, ANDREW V.	
	Examiner	Art Unit	
	Jakieda R Jackson	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-23 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-23 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 26 January 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claim 1** is rejected under 35 U.S.C. 102(b) as being anticipated by Esteban et al. (U.S. Patent No. 4,051,470), hereinafter referenced as Esteban.

Regarding **claim 1**, Esteban discloses a computer system with a spectral audio data encoder having an actual bit-rate feedback, uniform, scalar quantizer, a method for reducing the number of iterations of a quantization loop for a block of spectral audio data, the method comprising:

a) setting a polynomial (column 3, line 64 – column 4, line 19) that relates actual bit-rate to quantization threshold (decision level; column 6, lines 1-8) for spectral audio data in an actual bit-rate feedback (recirculates; column 3, lines 7-10), uniform, scalar quantizer (figures 4A and 4B), the initial coefficients for the polynomial *column 2, lines 9-17) set for typical spectral audio data (column 1, lines 66-67 with figures 4A and 4B);

b) calculating a candidate quantization threshold (decision level; column 6, lines 1-7) for a block of spectral audio data (column 1, lines 66-67 with figures 4a and 4B) based upon the polynomial (column 2, lines 9-17);

c) quantizing the block of data with the candidate quantization threshold (column 6, lines 1-7);

d) measuring bit-rate of output following compression of the quantized block (figures 4A and 4B);

e) if the measured bit-rate falls within a pre-determined range (decision level) below a target bit-rate (lower in value), designating the candidate quantization threshold as final quantization threshold (column 6, lines 1-7);

else adjusting one or more coefficients of the polynomial and repeating b)-e (recirculates as many times as required; column 3, lines 7-10).

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 2-3, 7-10, 17-19 and 21-22** are rejected under 35 U.S.C. 102(e) as being anticipated by Malvar (U.S. Patent No. 6,029,126).

Regarding **claim 2**, Malvar discloses a computer-readable medium storing instructions for a method of reducing the number of iterations of a quantization loop, the method comprising:

a) setting a model (modeling; column 5, lines 10-12) that relates actual bit-rate to uniform (figure 3, element 314), scalar quantization threshold (figure 4, elements 416 and 420) for a data type in an actual bit-rate feedback quantizer (column 14, lines 12-16);

b) calculating a candidate uniform (figure 3, element 314) , scalar quantization threshold (figure 4, elements 416 and 420) for a block of input data based upon the model (column 5, lines 10-12);

c) quantizing the block of input data with the candidate quantization threshold (column 14, lines 34-42);

d) measuring bit-rate of output following compression of the quantized block (column 11, lines 45-48 with column 17, lines 53-58);

e) if the measured bit-rate is acceptable (minimally perceived), designating the candidate quantization threshold as final quantization threshold for the block of input data; (column 15, lines 10-13)

else adjusting the model and repeating b)-e) (column 14,lines 12-16 with lines 37-39).

Regarding **claim 3**, Malvar discloses the computer-readable medium wherein initial parameters for the model (parametric modeling) are set for typical spectral audio data (spectral structure of voiced speech; column 8, lines 4-13).

Regarding **claim 7**, Malvar discloses a computer-readable medium storing instructions for a method of dequantizing the block of input data quantized, the method comprising:

receiving the block of input data (signal blocks; column 9, lines 9-10); and

applying the final quantization threshold (inverse masking threshold) to the block of input data in inverse quantization (inverse uniforming quantizer; column 7, lines 35-41).

Regarding **claim 8**, Malvar discloses a computer system with an encoder having a quantizer, a method for finding a quantization threshold using a quantization loop with a heuristic approach, the method comprising:

estimating a quantization threshold (predetermined precision level; column 14, lines 34-42) based upon a heuristic model of actual bit-rate (column 5, lines 10-12) versus quantization threshold (thresholds are quantized), wherein the model adjusts responsive to negative evaluation of an acceptability criterion for the estimated quantization threshold (column 14, lines 34-42);

evaluating whether bit-rate of compressed output quantized by the estimated quantization threshold satisfies the acceptability criterion (minimally perceived) and if so, designating the estimated quantization threshold as final quantization threshold (column 15, lines 10-13), and if not, adjusting the model and repeating the estimating and evaluating (column 14,lines 37-39 with lines 12-16 and column 19, lines 41-44).

Regarding **claim 9**, Malvar discloses the method wherein the quantization threshold is a uniform (figure 3, element 314), scalar quantization threshold (figure 4, elements 416 and 420).

Regarding **claim 10**, Malvar discloses the method wherein the model is initially parameterized (parametric modeling) for typical spectral audio data (spectral structure of voiced speech; column 8, lines 4-13).

Regarding **claim 17**, Malvar discloses a computer system, a bit-rate feedback quantizer comprising:

a threshold estimator (predetermined precision level; column 14, lines 34-42) for estimating a quantization threshold based upon a model of actual bit-rate (column 5, lines 10-12) versus quantization threshold (thresholds are quantized), wherein the threshold estimator adjusts the model responsive to a negative evaluation of an acceptability criterion for the quantization threshold (column 14, lines 34-42);

a threshold evaluator for evaluating actual bit-rate of output following compression (column 17, lines 53-58 with column 19, lines 36-44), the threshold evaluator further evaluating whether the estimated quantization threshold satisfies the acceptability criterion (minimally perceived; column 15, lines 10-13).

Regarding **claim 18**, Malvar discloses the quantizer wherein the threshold estimator adjusts parameters of the model (parametric modeling increased) initially set according to data type (better reflect actual distribution; column 8, lines 3-11).

Regarding **claim 19,** Malvar discloses the quantizer wherein the data type is spectral audio data (spectral structure of voiced speech; column 5, lines 12-14).

Regarding **claim 21**, Malvar discloses the quantizer wherein the quantization threshold is a uniform (figure 3, element 314), scalar quantization threshold (figure 4, elements 416 and 420).

Regarding **claim 22**, Malvar discloses a computer-readable medium storing instructions for a bit-rate feedback quantizer with a heuristic approach, the quantizer comprising:

means for estimating a quantization threshold (predetermined precision level; column 14, lines 34-42) based upon a heuristic model of actual bit-rate (mathematical looping; column 14, lines 12-16 and column 19, lines 41-56) as a function of quantization threshold (thresholds are quantized), wherein the means for estimating adjusts one or more parameters of the model responsive to a negative evaluation of acceptability of the estimated quantization threshold (column 14, lines 34-42);

means for evaluating actual bit-rate following compression of output quantized by the estimated quantization threshold (column 17, lines 53-58 with column 14, lines 34-42), wherein the means for evaluating further evaluates the acceptability of the estimated quantization threshold (minimally perceived; column 15, lines 10-13).

Regarding **claim 23**, Malvar discloses a computer-readable medium storing instructions for a method of dequantizing a block of input data quantized in a bit-rate feedback quantizer with a heuristic approach, the method comprising:

receiving a block of quantized input data (column 8, lines 30-31), the input data quantized by a bit-rate feedback quantizer with a heuristic approach (mathematical looping process; column 14, lines 12-16 with column 19, lines 41-56);

the quantizer including a threshold estimator (predetermines precision level; column 14, lines 34-42) and a threshold evaluator (comparing thresholds) the threshold estimator for estimating a quantization threshold based upon a heuristic model of actual bit-rate versus quantization threshold (column 14, lines 34-42), wherein the threshold estimator adjusts the model responsive to a negative evaluation of an acceptability criterion for the estimated quantization threshold (column 14, lines 34-42), the threshold evaluator for evaluating actual bit-rate following compression (column 17, lines 53-58 with column 14, lines 34-42) of output quantized by the estimated quantization threshold, wherein the threshold evaluator further evaluates whether the estimated quantization threshold satisfies the acceptability criterion (minimally perceived; column 8, lines 10-13); and

applying the final quantization threshold to the block of quantized input data (signal blocks; column 9, lines 9-10) in inverse quantization (inverse uniforming quantizer; column 7, lines 35-41).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 4 and 11-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Malvar in view of Esteban et al. (U.S. Patent No. 4,051,470).

Regarding **claim 4**, Malvar discloses the computer-readable medium but lacks calculating a candidate quantization threshold in a first, second and subsequent iteration using equation.

Esteban discloses the computer-readable medium, but does not specifically disclose calculating a candidate quantization threshold in a first, second and subsequent iteration using equations claimed in claim 4.

However, examiner takes Official Notice of the fact that these equations are well known obvious variants in the audio signal processing with compression art for their use in quantizing. To substitute any of the specific equations for Esteban's polynomials (column 2, lines 16-29) would have been an obvious functional equivalent.

Regarding **claims 11-13**, they are interpreted and rejected for the same reasons as set forth in claim 4.

7. **Claims 5-6, 14, 16 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Malvar in view of Astle (U.S. Patent No. 5,835,149).

Regarding **claims 5 and 6**, Malvar discloses the computer-readable medium, but lacks wherein the measured bit-rate is acceptable if the measured bit-rate lies within a predetermined range around a target bit-rate.

Astle discloses the computer-readable medium wherein the measured bit-rate is acceptable if the measured bit-rate lies within (approaches) a predetermined range around a target bit-rate (target bitstream rate; column 11, lines 33-45), to produce a target that it that has applicable characteristics.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Malvar's medium wherein the measured bit-rate is acceptable if the measured bit-rate lies within a predetermined range around a target bit-rate, to prevent data being lost, which allows the average codesize to be achieved (column 11, lines 33-57).

Regarding **claim 14**, Malvar discloses the method for finding a quantization threshold, but lacks wherein the acceptability criterion comprises proximity of the evaluated bit-rate to a target-bit-rate.

Astle discloses the method for finding a quantization threshold wherein the acceptability criterion comprises proximity of the evaluated bit-rate (adjusted bit rate) to a target-bit-rate (target bitstream; column 11, lines 33-45), to produce a target that it that has applicable characteristics.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Malvar's method wherein the acceptability criterion comprises proximity of the evaluated bit-rate to a target-bit-rate, to prevent data being lost, which allows the average codesize to be achieved (column 11, lines 33-57).

Regarding **claim 16**, Malvar discloses a method of dequantizing compressed output quantized by the estimated quantization threshold designated as the final quantization threshold, the method comprising:

receiving the compressed output (compression; column 17, lines 53-58); and

applying the final quantization threshold (column 14, lines 34-42 with column 15, lines 10-13) to the decompressed output in an inverse quantization operation (inverse uniform quantizer; column 7, lines 35-41), but lacks decompressing the compressed output.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to decompress the compressed output, to assist in storing images in a format which reduces storage space without removing detail and to lower bit rates, as taught by Astle (column 6, lines 10-20).

Regarding **claim 20**, Malvar discloses the quantizer, but lacks wherein the acceptability criterion comprises proximity of the actual bit-rate to a target.

Astle discloses the quantizer wherein the acceptability criterion comprises proximity of the actual bit-rate (adjusted bit rate) to a target-bit-rate (target bitstream; column 11, lines 33-45), to produce a target that it that has applicable characteristics.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Malvar's method wherein the acceptability criterion comprises proximity of the actual bit-rate to a target-bit-rate, to prevent data being lost, which allows the average codesize to be achieved (column 11, lines 33-57).

8. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Malvar in view of Astle, as applied to claim 14, in further view of Esteban.

Regarding **claim 15**, Malvar in view of Astle, as applied to claim 14 discloses the method for finding a quantization threshold, but lacks wherein the acceptability criterion further comprises satisfaction of a minimum logarithmic distance threshold between quantization thresholds in successive iterations.

Esteban discloses the method wherein the acceptability criterion further comprises satisfaction of a minimum logarithmic distance threshold (satisfactory minimum error) between quantization thresholds in successive iterations (successive iterations; column 3, lines 54-67), to avoid receiving a null final.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Malvar in combination with Astle's method wherein the acceptability criterion further comprises satisfaction of a minimum

logarithmic distance threshold between quantization thresholds in successive iterations, to code samples at a low bit rate while ensuring a low quantization noise (column 1, lines 46-48).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Wu et al. (U.S. Patent No. 6,370,502) discloses a method and system for reduction of quantization-induced block-discontinuities and general purpose audio codec.
- Gao et al. (U.S. Patent No. 6,574,593) discloses codebook tables for encoding and decoding.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jakieda R Jackson whose telephone number is 703.305.5593. The examiner can normally be reached on Monday through Friday from 7:30 a.m. to 5:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703. 305.4827. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JRJ
September 2, 2004

SUSAN MCFADDEN
PRIMARY EXAMINER